

Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PARTIAL SOLUTION BY F. L. WILMER, Omaha, Neb.

As usual let a and b denote the abscissa and ordinate, respectively, of the terminus of the vector a + ib in its standard position, and |a + ib| its absolute value.

Because $a^2 + b^2$ must be equal to the square of the cosine of some angle, say α , therefore $c^2 + d^2 = \sin^2 \alpha$. Similarly for x, y, z, w and an angle, say β .

For given values of the moduli the sum of any number of complex numbers has its maximum absolute value when the arguments are equal or differ by multiples of 2π , and this maximum is the sum of the moduli.

Let the arguments of
$$a+ib$$
, $i(c+id)$, $x+iy$, $i(z+iw)$, be θ_1 , θ_1' , θ_2 , θ_2'

The arguments of the three terms of the given expression will be $\theta_1 + \theta_2$, $\theta_1 + \theta_2'$, $\theta_1' + \theta_2$, and these will be equal if $\theta_1' = \theta_1$ and $\theta_2' = \theta_2$ (to multiples of 2π).

The modulus of the given expression will then be

$$R = 2 \cos \alpha \cos \beta + \cos \alpha \sin \beta + \sin \alpha \cos \beta$$

= \cos (\alpha + \beta) + \cos (\alpha - \beta) + \sin (\alpha + \beta).

Now in order that R be a maximum we must have $\partial R/\partial \alpha = 0$ and $\partial R/\partial \beta = 0$, simultaneously. That is,

$$-\sin(\alpha+\beta)-\sin(\alpha-\beta)+\cos(\alpha+\beta)=0,$$

and

$$-\sin(\alpha+\beta) + \sin(\alpha-\beta) + \cos(\alpha+\beta) = 0;$$

whence $\alpha = \beta = \pi/8$, giving¹

$$R_m = \cos \pi/4 + 1 + \sin \pi/4 = \sqrt{2} + 1.$$

2896. (1921, 227) Proposed by the late L. G. WELD.

A circle is inscribed in a triangle. In each of the three spandrels between this circle and the vertices another circle is described; in each of the three spandrels between the last circles and the vertices another circle; and so on ad infinitum. Show that the ratio of the sum of the areas of all the circles to the area of the triangle is

$$\frac{\Sigma}{\Delta} = \frac{\pi}{4} \frac{\Delta}{S^2} \left[\frac{1}{\sin \frac{1}{2}A} + \frac{1}{\sin \frac{1}{2}B} + \frac{1}{\sin \frac{1}{2}C} - 2 + \sin \frac{1}{2}A + \sin \frac{1}{2}B + \sin \frac{1}{2}C \right].$$

This problem is identical with problem 483 Geometry already proposed by Professor Weld (1916, 79), and solved by J. A. Caparo (1916, 344–346). It was re-proposed through an oversight.

NOTES AND NEWS.

It is to be hoped that readers of the MONTHLY will coöperate in contributing to the general interest of this department by sending items to H. P. MANNING, Brown University, Providence, R. I.

At the University of Pennsylvania, Mr. J. D. ESHLEMAN, of the University of Chicago, has been appointed instructor of mathematics. Mr. J. M. Thomas resigned his instructorship to accept a Harrison Fellowship in the Graduate School.

$$z = y \tan \alpha$$
, $w = -x \tan \alpha$, $x^2 + y^2 + z^2 + w^2 = 1$. —Editor.

¹ We might say, $R = \sqrt{2} \cos (\pi/4 - \alpha - \beta) + \cos (\alpha - \beta)$, and as α and β are independent this expression has a maximum equal to $\sqrt{2} + 1$ when $\alpha + \beta = \pi/4$ and $\alpha - \beta = 0$.

The condition that the given expression have its maximum absolute value is that the points (x, y, z, w) and (a, b, c, d) shall be two points of the circle whose equations are

Dr. E. F. Nichols, inaugurated as president of Massachusetts Institute of Technology in June (1921, 336), resigned in November, on account of ill health. The Institute is directed by a committee consisting of Professors H. P. Talbot, E. F. Miller, and E. B. Wilson.

A. V. MILLER, associate professor of drawing and descriptive geometry at the University of Wisconsin, has been appointed assistant dean of the college of engineering.

At the University of Wisconsin, Assistant Professor Arnold Dresden has been promoted to an associate professorship and Mr. E. B. Miller has been appointed instructor of mathematics.

At the University of Illinois, Dr. J. M. Stetson, of Yale University, Dr. Beulah Armstrong, of the University of Illinois, and Dr. C. C. Camp, formerly assistant professor at Iowa State College, have been appointed instructors of mathematics.

Dr. Harlow Shapley, whose appointment as observer at the Harvard College Observatory has already been noted in this Monthly (1921, 233), was, in November, made director of the Observatory—a post which has been vacant since the death of E. C. Pickering in 1919 (1919, 134). The recent acting director, Professor S. I. Bailey (1921, 233), expects in a few months to return to Harvard's South American astronomical station at Arequipa, Peru. Dr. Shapley was born at Nashville, Mo., thirty-five years ago. Graduating from the University of Missouri, he was a fellow at Princeton University, 1912-1914, where he received his doctorate in 1913. He was at the Mt. Wilson Observatory, 1914-1921. He perfected methods of measuring star distances photometrically, and applied these methods to the problem of the distances and structures of great star-"Dr. Shapley is also known as an entomologist, and has done interesting work in investigating the ants of the California mountains. He discovered that the speed at which these creatures move depends on the temperature, and that for some species the time of running through a 'speed-trap,' as shown by the stop-watch, gives the temperature of the surrounding air within one degree. He found that the ants went twelve times as fast at 100 degrees as at 50 degrees." —Harvard Alumni Bulletin, November 10, 1921.

Judson Boardman Coit, teacher of mathematics and astronomy in Boston University since 1882, died on July 26, 1921. He was born in Oswego County, New York, June 5, 1849, and graduated from Syracuse University (A.B., 1875; A.M., 1878; Ph.D., 1881). He was professor of mathematics at Dickinson Seminary, Williamsport, Pa., 1875–1879, assistant in the observatory at Ann Arbor, 1879–1880, and teacher of mathematics in a Cleveland high school, 1880–1882. Appointed assistant professor of mathematics and astronomy in Boston University in 1882, he was promoted to a professorship in 1884. In 1915 he was made professor of astronomy. He was acting dean of the graduate school 1911–12. His son, Dr. W. A. Coit, has been professor of mathematics at Acadia College, Wolfville, Nova Scotia, since 1908.

THE ZIWET COLLECTION.

By L. C. Karpinski, University of Michigan.

The development of a modern university library requires over long periods of time the devoted service of scholars in many fields. Even in a limited field, such as mathematics, the building of a working library is a serious task of many years.

For a third of a century Professor Alexander Ziwet has given scholarly attention to the library needs of the University of Michigan. Unusual linguistic ability coupled with equally unusual devotion to bibliographical and scholarly affairs combine to make Professor Ziwet's record of service to the library a notable one. At the same time Professor Ziwet was building up a private collection, strong in general mathematics and in the first rank of collections on mechanics. This personal library, comprising a total of over five thousand volumes, Professor Ziwet has recently given to the University of Michigan.

The library is composed as follows: Miscellaneous volumes, about equally mathematics and mechanics, 2092; Miscellaneous pamphlets, 838; Serials, sets of volumes, etc., 1414; Classical volumes, 364; and Classical pamphlets, 127.

Any one who has worked in the University of Michigan Library is aware of the fact that this recent gift by Professor Ziwet is only the culmination of a series of notable gifts extending over many years.

It would take more space than is at my disposal to list noteworthy volumes included. As indicated, the mechanics collection is particularly complete including the best Dutch, Scandinavian, German, French, Spanish, Italian, Russian, and English works which have appeared during the past fifty years. In addition there are numerous first editions of classical works on mechanics such as those by Newton, Lagrange, D'Alembert, Euler, D. Bernoulli, Hermann, Marie, Coulomb, Carnot, and Chasles. A practically complete set of works by Duhem is worth noting.

The collection adds many items on the history of the mathematical and astronomical sciences, to a collection now one of the first in the United States. This collection has been built up through the coöperation of Professors Beman, Ziwet, Hussey, and the writer with the continued active assistance of the librarians at Michigan.

With characteristic generosity Professor Ziwet has made no conditions in regard to his gift. In consequence the duplicates will in all likelihood be used for exchange purposes to further strengthen the mathematical library.

The permanent and increasing value of such collections is beyond dispute. Generations of students to come will have cause to be grateful to the collector, Alexander Ziwet, whose devotion to science is reflected in this munificent and enduring collection.